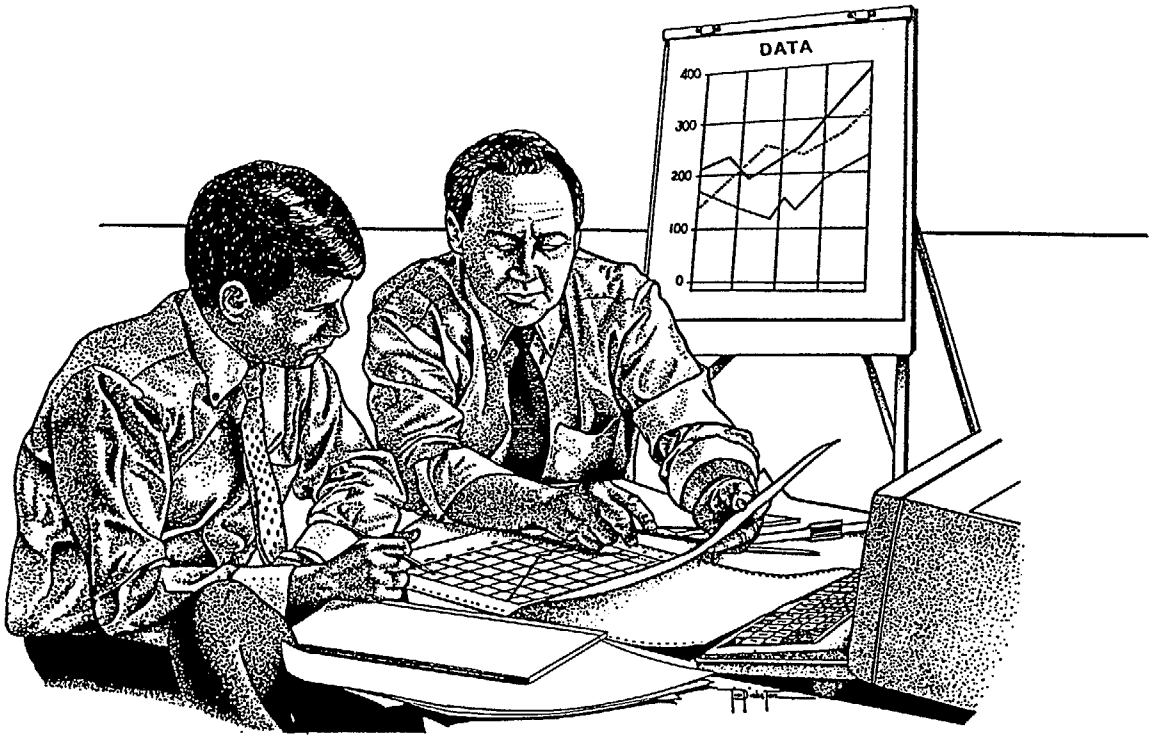
Chapter Three
FACILITY REQUIREMENTS

H.A. Clark Memorial Field



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H.A. Clark Memorial Field

The objective of this stage of the planning effort is to identify, in general terms, the adequacy and capacity of existing airport facilities, outline what new facilities may be needed, and when they may be needed to keep pace with forecast aviation demand. To identify future aviation facility needs, established planning criteria are applied to the results of aviation forecasts.

Once these needs are established, alternatives will be developed and evaluated in the following chapter to determine the most functional and efficient means for implementation.

AIRSIDE FACILITY REQUIREMENTS

Airside facilities are those that are related to the arrival and departure of aircraft. These facilities are comprised of the following items.

- Runways
- Taxiways
- Navigational Aids
- Marking and Lighting

The FAA has established criteria for use in the sizing and design of airfield facilities. The selection of the appropriate FAA design standards for the development of airfield facilities is based primarily upon the characteristics of the aircraft that are expected to use the airport. The most important aircraft characteristics in airfield planning are the approach speed and the wingspan of the most demanding aircraft using the airport now or expected to use the airport in the future. Planning for future aircraft use is particularly important because design standards are used to plan separation distances between facilities that could be extremely costly to relocate at a later date as aircraft use characteristics change.

The FAA standards include airport design criteria relating to the size of an aircraft as well as its performance and speed. According to *FAA Advisory Circular (AC) 150/5300-13, Airport Design*, aircraft *Approach Categories* are based on 1.3 times the aircraft's stall speed in the landing configuration at its maximum certificated weight. The five approach categories used in airport planning are described below.

Category A: Speeds less than 91 knots.

Category B: Speeds 91 knots or more, but less than 121 knots.

Category C: Speeds 121 knots or more, but less than 141 knots.

Category D: Speeds 141 knots or more, but less than 166 knots.

Category E: Speeds 166 knots or more.

Categories A and B include small, propeller aircraft and certain smaller business jets, Categories C, D and E consist of the remaining business jets as well as larger jet and propeller aircraft generally associated with commercial and military use.

The second basic design criteria relates to the size of an airplane. The *Airplane Design Group* (ADG) is based upon wingspan. The six ADG groups are described as follows.

Group I: Wingspans of up to but not including 49 feet.

Group II: Wingspans of 49 feet up to but not including 79 feet.

Group III: Wingspans of 79 feet up to but not including 118 feet.

Group IV: Wingspans of 118 feet up to but not including 171 feet.

Group V: Wingspans of 171 feet up to but not including 214 feet.

Group VI: Wingspans of 214 feet up to but not including 262 feet.

FAA AC 150/5300-13, Airport Design, identifies a coding system which is used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. This code, called the *Airport Reference Code*, combines the aircraft Approach Category and the Airplane Design Group. With the selection of the most appropriate Airport Reference Code, the airport design criteria contained within AC 150/5300-13 can be applied. Typically, the aircraft approach speed is critical for designing runways and runway-related facilities, while ADG categories are critical for identifying separation criteria involving taxiways and taxilanes.

Based on the forecasts described in Chapter Two, and in accordance with the FAA's design standards, general aviation activity at H.A. Clark Memorial Field would be classified as Airport Reference Code *B-II*. If, on the other hand, the proposed commercial service special use is implemented, the Airport Reference Code would be *B-III*. Throughout the following analysis, consideration is given to both B-II and B-III standards, as well as the specific needs of the Douglas DC-4 aircraft, when these needs are potentially more restrictive. As previously stated in the forecast chapter, Biegert Aviation plans to use DC-4 aircraft to operate Classic Air at H.A. Clark Memorial Field as part of a larger Grand Canyon Railroad tour package. With the consideration of B-II, B-III and DC-4

standards, facility requirement comparisons can be drawn.

The airfield facility requirements outlined in this chapter correspond to the design standards described in FAA's AC 150/5300-13, Airport Design. The following sections describe the scope of facilities that would be necessary to accommodate the airport's continued role as a general aviation facility, as well as its potential role to also accommodate the planned commercial service special use.

RUNWAY

The adequacy of the existing runway system was analyzed from a number of perspectives including runway orientation, airfield capacity, runway length, and pavement strength. From this information, requirements for runway improvements were determined for the H.A. Clark Memorial Field.

Runway Orientation

Wind conditions are of prime importance in determining runway orientation. Where prevailing winds are consistently from one direction, runways are generally oriented in that direction. In most areas, however, consistency of wind direction is not found. In such instances, a multiple runway system, with crosswind runways, may be necessary. The FAA has established guidelines recommending that airport runway systems provide 95 percent wind coverage. The 95 percent wind coverage is computed on the basis of the crosswind not exceeding 10.5 knots for Airport Reference Codes (ARC) A-I and B-I; 13 knots for ARC A-II and B-II; 16 knots for ARC A-III, B-III, and C-I through D-III; and 20 knots for ARC A-IV through D-VI.

Since no on-site wind data is available, the best available wind data would be that collected for Flagstaff Pulliam Airport. If one assumes that Flagstaff wind conditions reflect local (H.A. Clark Memorial Field) wind conditions, Runway 18-36 provides 97.33 percent of the 12 mile per hour crosswind component and 99.49 percent of the 15 mile per hour crosswind component. In each case, Runway 18-36 would exceed the FAA recommended runway coverage of 95 percent.

Limited wind data is also available for several years, 1934 through 1938, for Maine, Arizona, located two to three miles from H.A. Clark Memorial Field. A wind rose was prepared based on this information in the previous Airport Master Plan. The results indicate wind coverage for Runway 18-36 of 96.7 percent for the 15 mile per hour crosswind component, which also exceeds FAA's recommended coverage.

Without information to the contrary, there is no indication at this time that a crosswind runway is warranted at H.A. Clark Memorial Field. Based on the wind information available, the FAA would not likely participate in the funding of structural improvements to Runway 02-20. For these reasons, it is recommended that this runway be abandoned. The following runway parameters are, therefore, provided for Runway 18-36 only.

Airfield Capacity

A demand/capacity analysis measures the capacity of the airfield facilities (i.e. runways and taxiways) in order to identify and plan for additional development needs. The capability of the airport's runway system to meet future operational demand can be determined without detailed

analysis. Annual capacity of a single runway configuration, without a parallel taxiway, is approximately 100,000 operations. With the construction of a partial or full parallel taxiway, as planned, the capacity of the runway system will be further enhanced. Since the forecasts for H.A. Clark Memorial Field indicate that by the end of the planning period the total annual operations will constitute less than 12,000 annual operations, the airfield configuration will be capable of satisfying operational demand throughout the planning period.

Runway Length

The determination of runway length requirements for the airport are based on four primary factors.

- Critical aircraft type expected to use the airport.
- Mean maximum daily temperature of the hottest month.
- Stage length of the longest nonstop trip destinations.
- Runway gradient.
- Airport elevation.

Based on the results of forecasting efforts, the most demanding types of general aviation aircraft anticipated to use the airport on a regular basis are small aircraft under 12,500 pounds. For the planned commercial service specialty use, DC-4 aircraft would also use the airport on a regular basis. Runway length requirements were computed for small aircraft under 12,500 pounds, as well as for DC-4 aircraft.

Aircraft operating characteristics are affected by three primary factors. They are the mean maximum temperature of the hottest month, the airport's elevation, and the gradient of the runway. The mean maximum temperature of the hottest month is 83.10 degrees Fahrenheit. The airport elevation is 6,680 feet mean sea level (MSL) and the maximum difference in runway centerline elevation is 43 feet. Aircraft over 60,000 pounds are also affected by the length of haul (the distance from airport to airport). Runway lengths for commercial service operations were calculated assuming a 500-mile range.

Table 3A provides the results of runway length requirements for H.A. Clark Memorial Field. Based on *FAA Advisory Circular 150/5300-13, Airport Design*, to accommodate 100 percent of small aircraft under 12,500 pounds, the runway length would need to be 7,980 feet. As indicated in Table 3A, provision of at least a 7,690-foot runway at H.A. Clark Memorial Field would also allow the airport to accommodate 75 percent of large airplanes of 60,000 pounds or less, at 60 percent of their useful load.

Because performance characteristics for DC-4's are not available for the density altitude of H.A. Clark Memorial Field, Biegert Aviation has initiated their development. Preliminary estimates indicate that approximately 8,000 feet of runway length would be needed to operate fully loaded DC-4's during the hotter months of the year. Biegert Aviation stated that if runway length was limited to 7,000 feet, they would have to limit their load to 45 to 50 passengers during the hotter days of the year. To adequately accommodate the planned commercial service specialty use of Classic Air, it would appear necessary to extend the primary runway from 6,000 to 8,000 feet.

TABLE 3A
Runway Length Requirements
H.A. Clark Memorial Field

AIRPORT AND RUNWAY DATA	
Airport Elevation	6,680 feet
Mean daily temperature of the hottest month	83.1°F
Maximum difference in runway centerline elevation	43 feet
RUNWAY LENGTH RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	5,640 feet
95 percent of these small airplanes	7,980 feet
100 percent of these small airplanes	7,980 feet
Small airplanes with more than 10 passenger seats	7,980 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	7,690 feet
75 percent of these large airplanes at 90 percent useful load	9,030 feet
100 percent of these large airplanes at 60 percent useful load	11,430 feet
100 percent of these large airplanes at 90 percent useful load	11,430 feet
Airplanes of more than 60,000 pounds	Aprx. 7,360 feet
Douglas DC-4	8,000 feet[1]

NOTES: [1] Runway length requirement based on preliminary estimates by Biegert Aviation, Inc. Requirement based on landing performance, since landings in DC-4's are more length demanding than take-offs.

A small airplane is an airplane of 12,500 pounds or less maximum takeoff weight.

REFERENCE: AC 150/5300-13, Airport Design, dated September 1, 1993

Runway Width

According to the *FAA Advisory Circular 150/5300-13*, a minimum runway width of 75 feet would meet the requirements for ARC B-II, representing the general aviation aircraft expected to use the airport over the planning period. Since the existing width of Runway 18-36 is only 60 feet, runway widening to a minimum of 75 feet would be required to accommodate the existing general aviation activity and that activity forecast for the planning period. In order to accommodate the DC-4, however, 100 feet of runway width would be needed.

Runway Pavement Strength

To accommodate the small aircraft of less than 12,500 pounds, runway pavement strength would need to be 12,500 pounds

single wheel loading (SWL). In order to accommodate the DC-4, with a maximum takeoff weight of 73,000 pounds, runway pavement strength would need to be upgraded to 80,000 pounds dual wheel loading (DWL).

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access to aircraft parking aprons, whereas other taxiways may be warranted to provide safe and efficient use of the airfield.

The one existing connecting taxiway at H.A. Clark Memorial Field is currently 30 feet in width. According to *FAA Advisory Circular 150/5300-13*, taxiways at H.A. Clark Memorial Field should be 35 feet in width for ARC B-II, representing forecast general aviation fleet mix. In order to accommodate the planned commercial service special use, represented by B-III, taxiways should be designed 50 feet in width. All taxiways should be maintained at the same pavement strength as the runway.

No parallel taxiway or parallel taxiway segments exist at H.A. Clark Memorial Field. Without a parallel taxiway, arriving aircraft must taxiway back on the runway to the existing connecting taxiway, which is located at roughly midfield. An aircraft turn-around exists on the north end of Runway 18-36. To improve safety and to enhance airfield efficiency, the construction of a full-length parallel taxiway and connecting taxiways is recommended by the year 2000. The City of Williams has recently accepted a federal grant for the design of a parallel taxiway at the airport. The grant includes funding to construct a portion of this taxiway.

The required separation between the runway centerline and the centerline of the parallel taxiway for ARC B-II is 240 feet, and for B-III is 300 feet. To provide future flexibility, the planned parallel taxiway is currently being designed with a centerline separation of 400 feet. At this distance, all separation standards for B-II and B-III aircraft will be met.

NAVIGATIONAL AIDS

Airport and runway navigational aid requirements are based on recommendations as depicted in *DOT/FAA Handbook 7031.2C, Airway Planning Standards Number One*, and *FAA Advisory Circular 150/5300-13*. Navigational aids provide visual, non-precision, or precision guidance to a runway or the airport itself. The basic difference between a non-precision and a precision navigational aid is that the latter provides electronic decent, alignment (course), and position guidance, while the non-precision navigational aid provides only alignment and position information. The necessity of such equipment is predicated on safety considerations and operational needs. The type, purpose, and volume of aviation activity expected at the airport are factors normally used in the determination of the airport's eligibility for navigation equipment.

A visual approach landing aid is recommended for the initial stage of development. There are several types of visual landing aids available, however, the FAA is currently supporting the installation of Precision Approach Path Indicators (PAPI) for most general aviation airports. Other landing aids are the Runway End

Identifier Lights (REIL) which are installed at the runway ends to help pilots make positive identification of the runway in poor weather or reduced visibility conditions.

It is recommended that an instrument approach procedure be planned for the short to mid-term planning period. The most likely choice is a non-precision approach utilizing a Non-Directional Radio Beacon (NDB). This instrument approach would assist pilots in landing at the airport during poor weather conditions and would allow for instrument approach training at H.A. Clark Memorial Field. Currently, the FAA is developing a new instrument approach procedure based on the Global Positioning System, or GPS. The feasibility of using this GPS system at H.A. Clark Memorial Field should be considered in the future.

MARKING AND LIGHTING

Lighting on runways, taxiways, and aprons provides security and enhances safety for aircraft movements during night operations. At the present time, Medium Intensity Runway Lighting (MIRL) is available on Runway 18-36. Because the system is non-standard, it is recommended that it be replaced within the short-term planning period. Additionally, appropriate runway markings will be required according to the type of approach available to the airport. Currently marked for visual approaches, the runway markings would be upgraded to non-precision markings in the short-term. Exhibit 3A, at the end of this Chapter, provides a summary of the airside requirements discussed in this section. A discussion of landside requirements follows in the remaining paragraphs.

LANDSIDE FACILITY REQUIREMENTS

Landside facilities are those necessary for handling of aircraft, pilot and passengers while on the ground. These facilities provide the essential interface between the air and ground transportation modes. These areas will be subdivided into three sections: general aviation facilities, commercial service facilities and support facilities.

GENERAL AVIATION FACILITIES

Components of the general aviation landside complex include the following types of facilities.

- Hangars
- Aircraft Parking Apron
- General Aviation Terminal
- Automobile Parking

Hangars

The demand for hangar facilities is dependent upon the quantity and types of aircraft expected to be based at the airport. Actual percentages of based aircraft desiring hangar space will vary across the country as a function of local climatic conditions, airport security and owner preferences. The percentage of based aircraft hangared normally ranges from 30 to 80 percent in areas with extreme weather conditions. In Arizona, at those locations where hangar facilities are available, demand for hangars varies between 60 and 80 percent. Due to the weather of Williams, it was assumed that 80 percent of the owners of single engine aircraft would desire hangars over tiedowns and that all owners of multi engine, and turboprop aircraft would prefer

hangar facilities. It was estimated that these percentages would remain constant over the planning period.

Consideration must also be given to the types of hangars needed at the airport. Generally, the primary users of conventional hangars are owners of larger based aircraft who desire convenient access to maintenance and related services. T-hangars are predominantly used to store single and light twin-engine aircraft. Since the numbers of based and transient aircraft forecast at the airport are not large enough to establish a market for a Fixed Based Operator (FBO), the expense of constructing a conventional hangar cannot be justified. However, if the market for a FBO develops during the planning period, a site for a conventional hangar can be identified for the development of an FBO facility.

A planning standard of 1,500 square feet (SF) per T-hangar was used for the dimensions of these facilities. The aircraft maintenance portion of the hangar is normally equivalent to approximately 10 percent of the total hangar storage area. This maintenance area will be in addition to the total individual hangar requirements.

Currently eight T-hangar facilities are located on the airport. Over the planning period, it is anticipated that these facilities will be replaced with new structures. Table 3B outlines the projected hangar requirements throughout the planning period.

TABLE 3B
Forecast Hangar Requirements
H.A. Clark Memorial Field

	Available	1995	2000	2005	2015
Based Aircraft	N/A	12	14	16	20
Aircraft to be hangared					
Single Engine	N/A	10	11	12	13
Multi Engine	N/A	0	1	1	2
Turboprop	N/A	0	0	0	1
Rotorcraft	N/A	0	0	0	1
Total T-Hangars	**8**	**10**	**12**	**13**	**16**
T-Hangar Area (SF)	N/A	15,000	16,500	19,500	24,000
Maintenance Area (SF)	N/A	1,500	1,650	1,950	2,400
Total Area (SF)	**N/A**	**16,500**	**18,150**	**21,450**	**26,400**

Aircraft Parking Apron

Adequate aircraft parking apron should be provided to accommodate those local aircraft not stored in hangars as well as transient aircraft. At H.A. Clark Memorial Field, no specific apron area has been designated for either local or transient parking. In determining future apron requirements, it is necessary to examine

local and transient tiedown facilities as separate entities. The local apron should at least meet the demand established by the unhangared based aircraft, or a total need for four (4) local tiedown positions by the year 2015. The number of based aircraft requiring tiedowns during the planning period are depicted in **Table 3C.**

The number of itinerant spaces can be estimated based on a knowledge of busy day operations at the airport. The number of transient spaces required at the airport was estimated as 50 percent of the busy day itinerant operations.

A planning criteria of 300 square yards (SY) per local aircraft and 360 SY per transient aircraft was used for the analysis presented in **Table 3C.** The analysis indicates that 14 tiedowns will be required by the end of the planning period to accommodate both local and itinerant traffic. While sixteen are currently available at the airport, their location will need to be examined in the following chapter.

TABLE 3C
Forecast Apron Requirements
H.A. Clark Memorial Field

	Available	1995	2000	2005	2015
Total Tiedowns	**16**	**10**	**10**	**12**	**14**
Local	N/A	2	2	3	4
Transient	N/A	8	8	9	10
Total Apron Area (SY)	**9,300[1]**	**3,480**	**3,480**	**4,140**	**4,800**

NOTE: [1] Includes aircraft movement areas.

General Aviation Terminal

General aviation terminal facilities serve several functions, such as, administrative and management offices, pilot's lounge and flight planning area, meeting facilities, food services, storage rooms, restrooms, and various other needs. This space is not necessarily limited to a single building and can be provided by the airport sponsor or an FBO facility. The methodology utilized to examine terminal building capacity generally relates square footage requirements for terminal facilities to the number of design hour general aviation pilots and passengers. Space requirements were determined for H.A. Clark Memorial Field using a standard of 75 square feet (SF) per general aviation design hour pilot and passenger. Based on this standard, a terminal size of 600 square feet would meet the general aviation terminal needs throughout the planning period.

Exhibit 3B summarizes the major facility requirements for the general aviation landside area of H.A. Clark Memorial Field. Please note that the square footage recommended for the general aviation terminal can be easily accommodated within the commercial service terminal if constructed as anticipated.

Automobile Parking

Vehicle parking demand related to general aviation activity at H.A. Clark Memorial Field is largely dependent upon the level of operations and the type of general aviation facilities and activities associated with the airport. General aviation automobile parking facilities are determined under guidelines set forth in FAA publications.

The public parking area requirements were based upon the number of design hour pilots and passengers. The total number of parking positions was based on 1.3 spaces per design hour passenger and 350 square feet per automobile parking space.

Table 3D reflects parking facilities that will be required through the end of the planning period. **Exhibit 3B** depicts the primary general aviation landside facility requirements identified.

TABLE 3D
General Aviation Vehicle Parking Requirements
H.A. Clark Memorial Field

	Available	1995	2000	2005	2015
Design Hour Pilots & Passengers	N/A	3	4	5	7
Parking Spaces	**No paved spaces**	**4**	**5**	**7**	**9**
Total Parking Area (SY)	**0**	**156**	**194**	**272**	**350**

COMMERCIAL SERVICE TERMINAL AREA

Components of the commercial service terminal area complex include the terminal building, aircraft gate positions and apron area. The following discussion outlines the facilities required to meet the terminal needs at H.A. Clark Memorial Field throughout the planning period.

The analysis of facility requirements for various terminal complex functional areas at the H.A. Clark Memorial Field was performed within the guidelines of *FAA AC 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities, 1988* and *FAA AC 150/5360-9, Planning and Design of Airport Terminal Facilities at Nonhub Locations*. These documents were used along with the results of the inventory and forecasts to prepare the total estimates of various terminal area requirements. For H.A. Clark Memorial Field, the planned commercial service activity would initially be that associated with Biegert Aviation's proposed Classic Air tour operation. The following facility needs are consistent with projections made by Biegert Aviation, Inc.

Commercial Service Terminal Building

The size of the terminal building will depend upon the type of airline operations it must accommodate as well as the peak activity periods expected on a regular basis. As discussed in the Forecast Chapter, the commercial service specialty use proposed for H.A. Clark Memorial Field creates a peak level of activity in the morning, roughly covering a one or one and one-half hour period. This concentration of morning arrivals is anticipated so that railroad passengers arrive in Williams before the

train departs, and can be returned to their original destination in the afternoon of the same day. This concept and Biegert Aviation's potential plans for future expansion are expected to yield as many as 300 passengers in the Design Hour by 2000 and up to 480 passengers in the Design Hour by the end of the planning period.

Utilizing the criteria established in the aforementioned FAA Advisory Circulars, the gross size of the commercial service terminal building was estimated. Size requirements of the terminal building were determined based on only those building functions necessary for the tour operation proposed, (i.e. lobby/waiting area, restrooms and office space). By the year 2000, a terminal building of roughly 3,500 square feet would be required; by the end of the planning period as estimated, a terminal of roughly 5,700 square feet would be needed. **Table 3E, Commercial Service Terminal Requirements**, provides the results of the terminal size calculations completed for H.A. Clark Memorial Field. Because the peaking characteristics of general aviation activity at the airport vary significantly from those of the commercial operations, the commercial service terminal would easily be capable of accommodating all general aviation terminal building functions as well.

TABLE 3E
Commercial Service Terminal Requirements
H.A. Clark Memorial Field

	Available	1995	2000	2005	2015
Commercial Service Terminal Size (SF)	0	0	3,500	4,000	5,700

Airline Gate and Positions and Parking Apron

In order to load and unload passengers from the commercial service aircraft, gate positions must be provided adjacent to the terminal. Based on Classic Air projections and apron requirements for the DC-4, the number of gates and associated apron requirements were estimated. It is estimated that three (3) gate positions will be required by the year 2000, requiring approximately 6,000 square yards of apron, and that four (4) gates would be needed by the year 2015, requiring a total of approximately 8,000 square yards. **Table 3F, Commercial Service Gate/Parking Positions**, depicts the number of gates and associated apron requirements estimated for the planning period.

Additional apron area would be needed for parking commercial service aircraft until these aircraft are scheduled to depart. It was estimated that four (4) additional parking positions would be needed to accommodate Classic Air in the year 2000, and that seven (7) additional positions would be needed by the year 2015. The apron requirements for these parking positions would range from 8,000 square yards in the year 2000 to 14,000 square yards by the end of the planning period. **Table 3F**, depicts the number of apron parking positions for commercial service aircraft and the associated apron size requirements.

TABLE 3F
Commercial Service Gate/Parking Positions
H.A. Clark Memorial Field

	Available	1995	2000	2005	2015
Gate Positions	0	0	3	3	4
Gate Apron Area (SY)	0	0	6,000	6,000	8,000
Parking Positions	0	0	4	5	7
Parking Apron Area (SY)	0	0	8,000	10,000	14,000

Commercial Service Vehicle Parking

Vehicle parking in the terminal area should be planned to accommodate vehicles of passengers, visitors and employees.

Due to the type of commercial service activity anticipated, standard guidelines for determining parking requirements were not considered to be applicable. Since Biegert Aviation plans call for transporting all passengers by bus between the airport and the railroad depot, it was assumed that no more than 10 public parking positions would be required by the year 2000. Five additional spaces were considered necessary to accommodate employees of Classic Air. Each parking space will require approximately 40 square yards of area for parking and maneuvering. **Table 3G, Commercial Service Vehicle Parking Requirements**, provides the results of this analysis.

To accommodate the bus activity anticipated in support of Classic Air, it was estimated that three to four buses would need to be parked at the airport for loading and unloading passengers at the terminal building over the planning period (**Table 3G**).

Exhibit 3C, located at the end of this chapter, summarizes the primary facilities needed throughout the planning period for the planned commercial service special use of Classic Air.

TABLE 3G
Commercial Service Vehicle Parking Requirements
H.A. Clark Memorial Field

	Available	1995	2000	2005	2015
Public Spaces	0	0	10	12	17
Employee Spaces	0	0	5	6	8
Total Automobile Spaces	**0**	**0**	**15**	**18**	**25**
Automobile Parking Area (SY)	0	0	585	700	975
Bus Spaces	0	0	3	3	4
Bus Parking Area (SY)	0	0	45	45	60
Total Parking Area (SY)	0	0	630	745	1,035

SUPPORT FACILITIES

Other facilities needed to support airfield and landside activities have also been estimated for H.A. Clark Memorial Field and are described in the following paragraphs. These include facility requirements for Airport Rescue and Firefighting (ARFF), Fuel Storage, and Airport Maintenance.

AIRPORT RESCUE AND FIREFIGHTING

Requirements for Airport Rescue and Firefighting (ARFF) services at an airport are established under *Federal Aviation Regulation (F.A.R.) Part 139* - Certification and Operations: Land Airports serving Air Carriers. This regulation governs airports with scheduled passenger service by aircraft with seating capacities over 30. With Classic Air providing service in DC-4's, with a passenger capacity of 60, compliance with ARFF requirements will be mandatory.

F.A.R. Part 139.49 establishes an ARFF index determination, beginning with Index A. This index rating is based on the number of departures conducted by aircraft within a specific length category. The longest length air carrier aircraft with an average of at least five daily departures determines the required Index group for the airport. With DC-4 aircraft, H.A. Clark Memorial Field will be Index B, which includes aircraft greater than or equal to 90 feet in length but less than 126 feet. Index B is expected to be adequate throughout the planning period.

Index B requires one or two vehicles carrying at least the following:

1) 500 pounds of sodium-based dry chemical or halon 1211; or
2) 450 pounds of potassium-based dry chemical and water with an equal quantity of Aqueous Film Forming Foam (AFFF) to total 100 gallons, for simultaneous dry chemical and AFFF application; and
3) 1,500 gallons of water.

ARFF vehicle's need to be stored in a location that permits adequate response time to an emergency under requirements of Part 139. Regulations require that at least one vehicle must be capable of reaching the mid-point of the farthest runway within three minutes. Due to the airport's distance from the city, consideration should be given to the construction of a small structure for storing the ARFF vehicle(s) on the airport property.

The regulations require that ARFF equipment and personnel be capable of responding to an emergency during those periods when air carrier operations are being conducted.

Currently, volunteer firefighting support is provided by the City of Williams through an existing fire station located over two miles south of the airport.

FUEL STORAGE

Future fuel storage requirements for H.A. Clark Memorial Field were estimated for projected general aviation and commercial service activities. For general aviation activity, a common standard of roughly three to four gallons per operation in the Peak Month was utilized. While fueling needs of Biegert Aviation, Inc. could vary significantly based on a number of factors, consultation with Biegert Aviation representatives indicated that a tank with a capacity of 15,000 gallons would probably

be sufficient in the early stages of the planning period. Fueling demand was expected to grow proportionally to commercial service operational levels for the remainder of the planning period.

Table 3H, Monthly Fuel Storage Requirements, provides a forecast of the monthly fuel storage capacity that will be required at H.A. Clark Memorial Field for general aviation activity as well as the commercial service specialty use. While the fuel needs of these two sectors are listed separately, separate fuel storage facilities may not be necessary or desired.

Storage requirements are based on a one month on-hand supply; however, more frequent deliveries can reduce the fuel storage capacity requirement. No fuel is currently stored on the airport. It is recommended that fuel storage tanks be installed for 100LL to meet the storage requirements provided in **Table 3H.**

TABLE 3H
Monthly Fuel Storage Requirements
H.A. Clark Memorial Field

	Available	1995	2000	2005	2015
General Aviation Fuel Storage Requirements	0	1,500	1,800	2,300	3,000
Commercial Service Fuel Storage Requirements	0	0	15,000	19,000	26,000
Total Monthly Fuel Storage	**0**	**1,500**	**16,800**	**21,300**	**29,000**

AIRPORT ACCESS

Access to H.A. Clark Memorial Field is available via Airport Road, a paved two-lane road, entering on the south side of the airport. This access point would appear to be adequate for the anticipated aviation activity at the airport during the planning period. If commercial service activity is realized during the planning period as planned, additional access circulation improvements within the terminal area could be warranted.

Currently, vehicles entering the airport have access to the runway/taxiway system. By allowing vehicle traffic access to the aircraft movement area, serious conflicts can arise. It is recommended that vehicle access be limited to automobile parking areas, thereby reducing the potential for vehicle-aircraft interactions.

UTILITIES

With future growth of the airport, and in particular, the development of commercial service use of the magnitude proposed, utility improvements to H.A. Clark Memorial Field will be necessary. The airport currently receives water from an on-site water storage tank. With the number of passengers anticipated at the airport, with the proposed Biegert tour operation, it may be necessary and desirable to connect the airport to the City's water delivery system in the future. While the airport currently operates off septic systems, the number of passengers anticipated will likely

also necessitate connection to the City's sanitary sewer line.

The City recently designed a fire protection delivery system to be operated from a 250,000 gallon water storage tank. The system will include a 10 inch water line and will be designed to accommodate 2,000 gallons per minute at 65 pounds per square inch. This system will include four (4) fire hydrant's to be located in the existing apron area. Construction of these facilities is expected to be completed by the end of calendar year 1994.

CONCLUSIONS

In order to accommodate future general aviation activity and to implement the commercial service specialty use planned by Biegert Aviation (or another similar commercial venture), a number of changes will be needed in the airside and landside facilities at H.A. Clark Memorial Field. **Exhibits 3A, Airside Facility Requirements, 3B, General Aviation Landside Requirements,** and **3C, Commercial Service Landside Requirements,** provide a summary of the facility needs identified.

The next step in the master planning process is to analyze alternatives that can accommodate these requirements. The next chapter will provide this analysis and recommend the best alternative for the future development of the H.A. Clark Memorial Field.

93MP08-3A-11/29/94

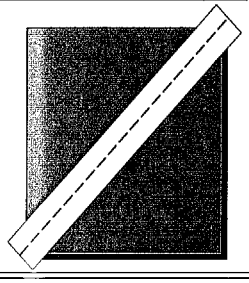
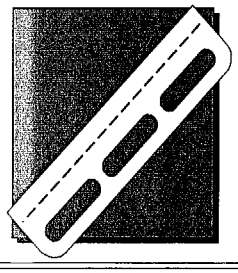
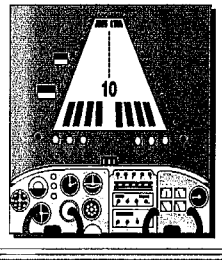
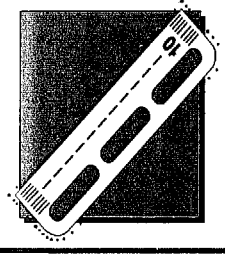
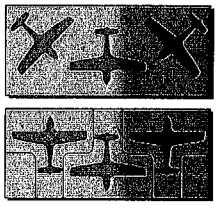
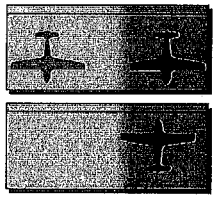
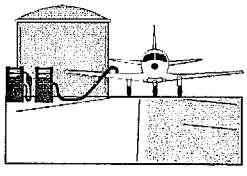
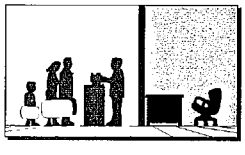
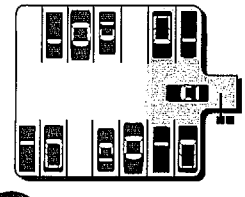
	EXISTING	2000	2005	2015
RUNWAYS 	Runway 18-36 6,000' x 60' 12,500 lbs SWL Runway 02-20 4,250' x 42' Unknown	Runway 18-36 8,000' x 100' 80,000 lbs DWL Runway 02-20 Abandon	Runway 18-36 8,000' x 100' Same	Runway 18-36 8,000' x 100' Same
TAXIWAYS 	Runway 18-36 Turnaround (Runway 18)	Runway 18-36 Full Parallel Connecting	Runway 18-36 Same	Runway 18-36 Same
NAVIGATIONAL AIDS 	Beacon Runway 18-36 None	Beacon Runway 18-36 NDB/GPS PAPI REIL	Beacon Runway 18-36 Same	Beacon Runway 18-36 Same
LIGHTING and MARKING 	Runway 18-36 MIRL Visual / Visual Taxiways Centerline	Runway 18-36 MIRL Non-Precision / Non-Precision Taxiways MITL Centerline	Runway 18-36 Same Taxiways Same	Runway 18-36 Same Taxiways Same

Exhibit 3A
AIRSIDE FACILITY REQUIREMENTS

93MP08-3B-11/29/94

	EXISTING	2000	2005	2015
HANGARS 	T-Hangars 8* * Recommend replacement	12	13	16
APRON TIE-DOWNS 	Local Apron Positions NA Itinerant Apron Positions NA Total Apron Positions 16	2 8 10	3 9 12	4 10 14
FUEL STORAGE 	Monthly Storage Requirements (Gallons) 0	1,800	2,300	3,000
GENERAL AVIATION TERMINAL 	Total Terminal Area (S.F.) 0	300	375	525
AUTO PARKING 	Parking Positions 0* * No paved parking positions available	5	7	9

H.A. Clark Memorial Field
AIRPORT MASTER PLAN
Williams, Arizona

Exhibit 3B
GENERAL AVIATION LANDSIDE REQUIREMENTS

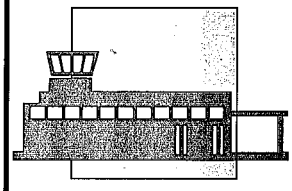
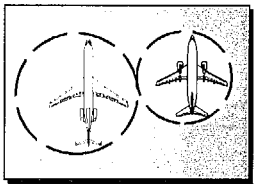
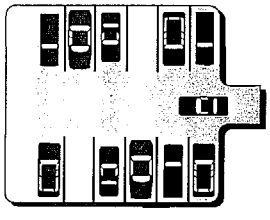
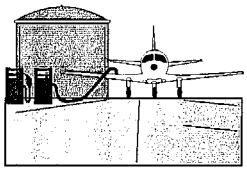
	EXISTING	2000	2005	2015
TERMINAL BUILDING				
				
Terminal Building (S.F.)	0	3,500	4,000	5,700
TERMINAL GATE POSITIONS				
				
Gate Positions	0	3	3	4
Apron Parking Positions	0	4	5	7
AUTO PARKING				
				
Automobile Positions	0	15	18	25
Bus Positions	0	3	3	4
FUEL STORAGE				
				
Monthly Storage Requirements (Gallons)	0	15,000	19,000	26,000

Exhibit 3C
COMMERCIAL SERVICE LANDSIDE REQUIREMENTS